

$$\begin{aligned}
& - \left(S \left(f(i) I(i=jp) f(j) I(j=ip) g(k) I(k=jp) g(l) I(l=ip) \right) \right)_{[i,j,k,l,ip,jp]} \\
& \frac{2 \left(S \left(f^2(i) I^2(i=k) g^2(j) I^2(j=k) \right) \right)_{[i,j,k]} M N}{M p N p} \\
& \frac{2 \left(S \left(f^2(i) I(i=k) I(i=l) g^2(j) I(j=k) I(j=l) \right) \right)_{[i,j,k,l]} M N}{M p N p} \\
& \frac{\left(S \left(g^2(i) I^2(i=k) f^2(j) I^2(j=l) \right) \right)_{[i,j,k,l]} M N}{M p N p} \\
& \frac{2 \left(S \left(f^2(i) I^2(i=k) g^2(j) I^2(j=k) \right) \right)_{[i,j,k]} M^2 N^2}{M p M^2 N - M p M N} \\
& \frac{2 \left(S \left(f^2(i) I(i=k) I(i=l) g^2(j) I(j=k) I(j=l) \right) \right)_{[i,j,k,l]} M^2 N^2}{N p M^2 N - N p M N} \\
& \frac{\left(S \left(g^2(i) I^2(i=k) f^2(j) I^2(j=l) \right) \right)_{[i,j,k,l]} M^2 N^2}{N p M^2 N - N p M N} \\
& \frac{2 \left(S \left(f^2(i) I^2(i=l) g(j) I(j=l) g(k) I(k=l) \right) \right)_{[i,j,k,l]} M^2 N^2}{N p M^2 N - N p M N} \\
& \frac{\left(S \left(g(i) I(i=l) g(j) I(j=l) f^2(k) I^2(k=ip) \right) \right)_{[i,j,k,l,ip]} M^2 N^2}{N p M^2 N - N p M N} \\
& \frac{2 \left(S \left(g(i) I(i=k) f^2(j) I(j=ip) I(j=k) g(l) I(l=ip) \right) \right)_{[i,j,k,l,ip]} M^2 N^2}{N p M^2 N - N p M N} \\
& \frac{2 \left(S \left(f^2(i) I^2(i=k) g^2(j) I^2(j=k) \right) \right)_{[i,j,k]} M^2 N^2}{M p N p M^2 N - M p N p M N} \\
& \frac{2 \left(S \left(f^2(i) I(i=k) I(i=l) g^2(j) I(j=k) I(j=l) \right) \right)_{[i,j,k,l]} M^2 N^2}{M p N p M^2 N - M p N p M N} \\
& \frac{\left(S \left(g^2(i) I^2(i=k) f^2(j) I^2(j=l) \right) \right)_{[i,j,k,l]} M^2 N^2}{M p N p M^2 N - M p N p M N} \\
& \frac{2 \left(S \left(f^2(i) I^2(i=l) g(j) I(j=l) g(k) I(k=l) \right) \right)_{[i,j,k,l]} M^2 N^2}{M p N p M^2 N - M p N p M N} \\
& \frac{\left(S \left(g(i) I(i=l) g(j) I(j=l) f^2(k) I^2(k=ip) \right) \right)_{[i,j,k,l,ip]} M^2 N^2}{M p N p M^2 N - M p N p M N} \\
& \frac{2 \left(S \left(g(i) I(i=k) f^2(j) I(j=ip) I(j=k) g(l) I(l=ip) \right) \right)_{[i,j,k,l,ip]} M^2 N^2}{M p N p M^2 N - M p N p M N} \\
& \frac{2 \left(S \left(f^2(i) I^2(i=k) g^2(j) I^2(j=k) \right) \right)_{[i,j,k]} M^2 N^2}{M p M N^2 - M p M N} \\
& \frac{2 \left(S \left(f^2(i) I(i=k) I(i=l) g^2(j) I(j=k) I(j=l) \right) \right)_{[i,j,k,l]} M^2 N^2}{M p M N^2 - M p M N} \\
& \frac{\left(S \left(g^2(i) I^2(i=k) f^2(j) I^2(j=l) \right) \right)_{[i,j,k,l]} M^2 N^2}{M p M N^2 - M p M N} \\
& \frac{2 \left(S \left(g^2(i) I^2(i=l) f(j) I(j=l) f(k) I(k=l) \right) \right)_{[i,j,k,l]} M^2 N^2}{M p M N^2 - M p M N} \\
& \frac{\left(S \left(f(i) I(i=l) f(j) I(j=l) g^2(k) I^2(k=ip) \right) \right)_{[i,j,k,l,ip]} M^2 N^2}{M p M N^2 - M p M N} \\
& \frac{2 \left(S \left(f(i) I(i=k) g^2(j) I(j=ip) I(j=k) f(l) I(l=ip) \right) \right)_{[i,j,k,l,ip]} M^2 N^2}{M p M N^2 - M p M N} \\
& \frac{2 \left(S \left(f^2(i) I^2(i=k) g^2(j) I^2(j=k) \right) \right)_{[i,j,k]} M^2 N^2}{M p N p M N^2 - M p N p M N} \\
& \frac{2 \left(S \left(f^2(i) I(i=k) I(i=l) g^2(j) I(j=k) I(j=l) \right) \right)_{[i,j,k,l]} M^2 N^2}{M p N p M N^2 - M p N p M N}
\end{aligned}$$

$$\begin{aligned}
& \frac{(S(g^2(i) I^2(i=k) f^2(j) I^2(j=l)))_{[i,j,k,l]} M^2 N^2}{Mp Np M N^2 - Mp Np M N} \\
& \frac{2(S(g^2(i) I^2(i=l) f(j) I(j=l) f(k) I(k=l)))_{[i,j,k,l]} M^2 N^2}{Mp Np M N^2 - Mp Np M N} \\
& \frac{(S(f(i) I(i=l) f(j) I(j=l) g^2(k) I^2(k=ip)))_{[i,j,k,l,ip]} M^2 N^2}{Mp Np M N^2 - Mp Np M N} \\
& \frac{2(S(f(i) I(i=k) g^2(j) I(j=ip) I(j=k) f(l) I(l=ip)))_{[i,j,k,l,ip]} M^2 N^2}{Mp Np M N^2 - Mp Np M N} \\
& \frac{2(S(f^2(i) I^2(i=k) g^2(j) I^2(j=k)))_{[i,j,k]} M^2 N^2}{M^2 N^2 - M N^2 - M^2 N + M N} \\
& \frac{2(S(f^2(i) I(i=k) I(i=l) g^2(j) I(j=k) I(j=l)))_{[i,j,k,l]} M^2 N^2}{M^2 N^2 - M N^2 - M^2 N + M N} \\
& \frac{(S(g^2(i) I^2(i=k) f^2(j) I^2(j=l)))_{[i,j,k,l]} M^2 N^2}{M^2 N^2 - M N^2 - M^2 N + M N} \\
& \frac{2(S(g^2(i) I^2(i=l) f(j) I(j=l) f(k) I(k=l)))_{[i,j,k,l]} M^2 N^2}{M^2 N^2 - M N^2 - M^2 N + M N} \\
& \frac{2(S(f^2(i) I^2(i=l) g(j) I(j=l) g(k) I(k=l)))_{[i,j,k,l]} M^2 N^2}{M^2 N^2 - M N^2 - M^2 N + M N} \\
& \frac{(S(g(i) I(i=l) g(j) I(j=l) f^2(k) I^2(k=ip)))_{[i,j,k,l,ip]} M^2 N^2}{M^2 N^2 - M N^2 - M^2 N + M N} \\
& \frac{(S(f(i) I(i=l) f(j) I(j=l) g^2(k) I^2(k=ip)))_{[i,j,k,l,ip]} M^2 N^2}{M^2 N^2 - M N^2 - M^2 N + M N} \\
& \frac{2(S(f(i) I(i=k) g^2(j) I(j=ip) I(j=k) f(l) I(l=ip)))_{[i,j,k,l,ip]} M^2 N^2}{M^2 N^2 - M N^2 - M^2 N + M N} \\
& \frac{2(S(g(i) I(i=ip) f(j) I(j=ip) g(k) I(k=ip) f(l) I(l=ip)))_{[i,j,k,l,ip]} M^2 N^2}{M^2 N^2 - M N^2 - M^2 N + M N} \\
& \frac{2(S(g(i) I(i=k) f^2(j) I(j=ip) I(j=k) g(l) I(l=ip)))_{[i,j,k,l,ip]} M^2 N^2}{M^2 N^2 - M N^2 - M^2 N + M N} \\
& \frac{(S(g(i) I(i=k) f(ip) I(ip=jp) g(j) I(j=k) f(l) I(l=jp)))_{[i,j,k,l,ip,jp]} M^2 N^2}{M^2 N^2 - M N^2 - M^2 N + M N} \\
& \frac{2(S(g(i) I(i=k) f(ip) I(ip=jp) f(j) I(j=k) g(l) I(l=jp)))_{[i,j,k,l,ip,jp]} M^2 N^2}{M^2 N^2 - M N^2 - M^2 N + M N} \\
& \frac{2(S(f^2(i) I^2(i=k) g^2(j) I^2(j=k)))_{[i,j,k]} M^2 N^2}{Mp M^2 N^2 - Mp M N^2 - Mp M^2 N + Mp M N} \\
& \frac{2(S(f^2(i) I(i=k) I(i=l) g^2(j) I(j=k) I(j=l)))_{[i,j,k,l]} M^2 N^2}{Mp M^2 N^2 - Mp M N^2 - Mp M^2 N + Mp M N} \\
& \frac{(S(g^2(i) I^2(i=k) f^2(j) I^2(j=l)))_{[i,j,k,l]} M^2 N^2}{Mp M^2 N^2 - Mp M N^2 - Mp M^2 N + Mp M N} \\
& \frac{2(S(g^2(i) I^2(i=l) f(j) I(j=l) f(k) I(k=l)))_{[i,j,k,l]} M^2 N^2}{Mp M^2 N^2 - Mp M N^2 - Mp M^2 N + Mp M N} \\
& \frac{2(S(f^2(i) I^2(i=l) g(j) I(j=l) g(k) I(k=l)))_{[i,j,k,l]} M^2 N^2}{Mp M^2 N^2 - Mp M N^2 - Mp M^2 N + Mp M N} \\
& \frac{(S(g(i) I(i=l) g(j) I(j=l) f^2(k) I^2(k=ip)))_{[i,j,k,l,ip]} M^2 N^2}{Mp M^2 N^2 - Mp M N^2 - Mp M^2 N + Mp M N} \\
& \frac{(S(f(i) I(i=l) f(j) I(j=l) g^2(k) I^2(k=ip)))_{[i,j,k,l,ip]} M^2 N^2}{Mp M^2 N^2 - Mp M N^2 - Mp M^2 N + Mp M N} \\
& \frac{2(S(f(i) I(i=k) g^2(j) I(j=ip) I(j=k) f(l) I(l=ip)))_{[i,j,k,l,ip]} M^2 N^2}{Mp M^2 N^2 - Mp M N^2 - Mp M^2 N + Mp M N}
\end{aligned}$$

$$\begin{aligned}
& \frac{2 \left(S(g(i) I(i=ip) f(j) I(j=ip) g(k) I(k=ip) f(l) I(l=ip)) \right)_{[i,j,k,l,ip]} M^2 N^2}{Mp M^2 N^2 - Mp M N^2 - Mp M^2 N + Mp M N} \\
& \frac{2 \left(S(g(i) I(i=k) f^2(j) I(j=ip) I(j=k) g(l) I(l=ip)) \right)_{[i,j,k,l,ip]} M^2 N^2}{Mp M^2 N^2 - Mp M N^2 - Mp M^2 N + Mp M N} \\
& - \frac{(S(g(i) I(i=k) f(ip) I(ip=jp) g(j) I(j=k) f(l) I(l=jp)))_{[i,j,k,l,ip,jp]} M^2 N^2}{Mp M^2 N^2 - Mp M N^2 - Mp M^2 N + Mp M N} \\
& - \frac{2 \left(S(g(i) I(i=k) f(ip) I(ip=jp) f(j) I(j=k) g(l) I(l=jp)) \right)_{[i,j,k,l,ip,jp]} M^2 N^2}{Mp M^2 N^2 - Mp M N^2 - Mp M^2 N + Mp M N} \\
& \frac{2 \left(S(f^2(i) I^2(i=k) g^2(j) I^2(j=k)) \right)_{[i,j,k]} M^2 N^2}{Np M^2 N^2 - Np M N^2 - Np M^2 N + Np M N} \\
& - \frac{2 \left(S(f^2(i) I(i=k) I(i=l) g^2(j) I(j=k) I(j=l)) \right)_{[i,j,k,l]} M^2 N^2}{Np M^2 N^2 - Np M N^2 - Np M^2 N + Np M N} \\
& - \frac{(S(g^2(i) I^2(i=k) f^2(j) I^2(j=l)))_{[i,j,k,l]} M^2 N^2}{Np M^2 N^2 - Np M N^2 - Np M^2 N + Np M N} \\
& - \frac{2 \left(S(g^2(i) I^2(i=l) f(j) I(j=l) f(k) I(k=l)) \right)_{[i,j,k,l]} M^2 N^2}{Np M^2 N^2 - Np M N^2 - Np M^2 N + Np M N} \\
& - \frac{2 \left(S(f^2(i) I^2(i=l) g(j) I(j=l) g(k) I(k=l)) \right)_{[i,j,k,l]} M^2 N^2}{Np M^2 N^2 - Np M N^2 - Np M^2 N + Np M N} \\
& - \frac{(S(g(i) I(i=l) g(j) I(j=l) f^2(k) I^2(k=ip)))_{[i,j,k,l,ip]} M^2 N^2}{Np M^2 N^2 - Np M N^2 - Np M^2 N + Np M N} \\
& - \frac{(S(f(i) I(i=l) f(j) I(j=l) g^2(k) I^2(k=ip)))_{[i,j,k,l,ip]} M^2 N^2}{Np M^2 N^2 - Np M N^2 - Np M^2 N + Np M N} \\
& \frac{2 \left(S(f(i) I(i=k) g^2(j) I(j=ip) I(j=k) f(l) I(l=ip)) \right)_{[i,j,k,l,ip]} M^2 N^2}{Np M^2 N^2 - Np M N^2 - Np M^2 N + Np M N} \\
& \frac{2 \left(S(g(i) I(i=ip) f(j) I(j=ip) g(k) I(k=ip) f(l) I(l=ip)) \right)_{[i,j,k,l,ip]} M^2 N^2}{Np M^2 N^2 - Np M N^2 - Np M^2 N + Np M N} \\
& \frac{2 \left(S(g(i) I(i=k) f^2(j) I(j=ip) I(j=k) g(l) I(l=ip)) \right)_{[i,j,k,l,ip]} M^2 N^2}{Np M^2 N^2 - Np M N^2 - Np M^2 N + Np M N} \\
& - \frac{(S(g(i) I(i=k) f(ip) I(ip=jp) g(j) I(j=k) f(l) I(l=jp)))_{[i,j,k,l,ip,jp]} M^2 N^2}{Np M^2 N^2 - Np M N^2 - Np M^2 N + Np M N} \\
& - \frac{2 \left(S(g(i) I(i=k) f(ip) I(ip=jp) f(j) I(j=k) g(l) I(l=jp)) \right)_{[i,j,k,l,ip,jp]} M^2 N^2}{Np M^2 N^2 - Np M N^2 - Np M^2 N + Np M N} \\
& - \frac{2 \left(S(f^2(i) I^2(i=k) g^2(j) I^2(j=k)) \right)_{[i,j,k]} M^2 N^2}{Mp Np M^2 N^2 - Mp Np M N^2 - Mp Np M^2 N + Mp Np M N} \\
& \frac{2 \left(S(f^2(i) I(i=k) I(i=l) g^2(j) I(j=k) I(j=l)) \right)_{[i,j,k,l]} M^2 N^2}{Mp Np M^2 N^2 - Mp Np M N^2 - Mp Np M^2 N + Mp Np M N} \\
& - \frac{(S(g^2(i) I^2(i=k) f^2(j) I^2(j=l)))_{[i,j,k,l]} M^2 N^2}{Mp Np M^2 N^2 - Mp Np M N^2 - Mp Np M^2 N + Mp Np M N} \\
& - \frac{2 \left(S(f^2(i) I^2(i=l) g(j) I(j=l) g(k) I(k=l)) \right)_{[i,j,k,l]} M^2 N^2}{Mp Np M^2 N^2 - Mp Np M N^2 - Mp Np M^2 N + Mp Np M N} \\
& - \frac{(S(g(i) I(i=l) g(j) I(j=l) f^2(k) I^2(k=ip)))_{[i,j,k,l,ip]} M^2 N^2}{Mp Np M^2 N^2 - Mp Np M N^2 - Mp Np M^2 N + Mp Np M N} \\
& - \frac{(S(f(i) I(i=l) f(j) I(j=l) g^2(k) I^2(k=ip)))_{[i,j,k,l,ip]} M^2 N^2}{Mp Np M^2 N^2 - Mp Np M N^2 - Mp Np M^2 N + Mp Np M N} \\
& - \frac{2 \left(S(f(i) I(i=k) g^2(j) I(j=ip) I(j=k) f(l) I(l=ip)) \right)_{[i,j,k,l,ip]} M^2 N^2}{Mp Np M^2 N^2 - Mp Np M N^2 - Mp Np M^2 N + Mp Np M N}
\end{aligned}$$

$$\begin{aligned}
& \frac{2 \left(S(g(i) I(i=ip) f(j) I(j=ip) g(k) I(k=ip) f(l) I(l=ip)) \right)_{[i,j,k,l,ip]} M^2 N^2}{Mp Np M^2 N^2 - Mp Np M N^2 - Mp Np M^2 N + Mp Np M N} \\
& \frac{2 \left(S(g(i) I(i=k) f^2(j) I(j=ip) I(j=k) g(l) I(l=ip)) \right)_{[i,j,k,l,ip]} M^2 N^2}{Mp Np M^2 N^2 - Mp Np M N^2 - Mp Np M^2 N + Mp Np M N} \\
& \frac{(S(g(i) I(i=k) f(ip) I(ip=jp) g(j) I(j=k) f(l) I(l=jp)))_{[i,j,k,l,ip,jp]} M^2 N^2}{Mp Np M^2 N^2 - Mp Np M N^2 - Mp Np M^2 N + Mp Np M N} \\
& \frac{2 \left(S(g(i) I(i=k) f(ip) I(ip=jp) f(j) I(j=k) g(l) I(l=jp)) \right)_{[i,j,k,l,ip,jp]} M^2 N^2}{Mp Np M^2 N^2 - Mp Np M N^2 - Mp Np M^2 N + Mp Np M N}
\end{aligned}$$

.